

**Final Work Plan
Contract No. W912DQ-11-D-3005
Task Order No. 0014**

**Operable Unit No. 1 (OU1)
Pre-Design Investigation (PDI) Work Plan
Diamond Head Oil Superfund Site
Kearny, New Jersey**

PREPARED FOR



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This Work Plan was finalized in January 2013. The planning documents for the scope of work contained in this Work Plan were finalized in September 2013. These documents include the UFP-Quality Assurance Project Plan, the Contractor Quality Control Plan, the Site Management Plan, and the Health and Safety Plan. While the Work Plan was finalized in January 2013, it is part of the package of planning documents and therefore, the date on its cover is updated to September 2013. The footers of the text remain as January 2013 for reference to when the Work Plan itself was actually finalized. The schedule in this September 2013 Work Plan is updated from the schedule in the January 2013 document; all remaining information remained the same.

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1.0 Introduction

The U.S. Environmental Protection Agency (USEPA) Region 2 has initiated an early action to address Light Non-Aqueous Phase Liquid (LNAPL) present at the Diamond Head Superfund site (Site) located in Kearny, NJ. The early action, identified as Operable Unit 1 (OU1), is initiated because the LNAPL is considered to represent a principal threat at the Site that can be mitigated while other site characterization activities planned as part of OU2 Remedial Investigations / Feasibility Studies (RI/FS) continue simultaneously.

The Record of Decision (ROD) for OU1 identified the biocell technology as a component of the preferred remedial alternative. A pre-design investigation (PDI) approach and scope were developed and presented in a Work Plan (dated August 31, 2010) to collect data to determine the area of OU1 principal threat and support the design of a biocell. The Work Plan included performing a bench scale test to evaluate the application of the biocell technology to treat principal threat materials. The results of the bench scale testing indicated that the technology would not achieve the Remedial Action Objectives (RAOs) and Preliminary Remedial Goals (PRGs) established in the OU1 ROD. Based on these results, excavation and offsite disposal, included in the ROD as another component of the preferred remedial alternative, are now considered the primary method to address the principal threat materials at the Site.

This revised Work Plan presents an updated technical approach and scope for the OU1 PDI, building on the knowledge gained on site conditions since the previous Work Plan, and scoping discussions held on August 22, August 28, and September 10, 2012. This Work Plan represents a continuation of the work initiated under Task Order 004 under contract W912DQ-08-D-0016. The objectives of the revised OU1 PDI are to collect the information needed to determine the materials that should be considered principal threat wastes and to delineate their occurrence at the Site. Information to support the design of the excavation and disposal remedy would also be collected although depending on the remedy design, there may be some design data needs remaining at the end of this PDI (for example, if it is determined that sheet piles should be installed during excavation, this PDI would not collect the geotechnical information that would be needed for their design). Finally, the information collected as part of the OU1 PDI will also be used to provide information and fill in data gaps in support of the OU2 RI/FS, for example, information collected during test pitting and from soil boring sampling along the berms will be used to support OU2 as well.

This work is being completed through a contract with the U.S. Army Corps of Engineers (USACE), Kansas City District.

This revised Work Plan consists of the following sections:

1. Introduction
2. General OU1 PDI Approach
3. Detailed OU1 PDI Scope of Work
4. Schedule

This revised Work Plan identifies the activities that will be completed moving forward. A cost proposal to implement this revised Work Plan will be submitted under separate cover following USEPA and USACE approval of the technical approach and scope. The cost

proposal will identify the estimated costs to complete the work as described in this revised Work Plan.

2.0 General OU1 PDI Approach

The following criteria were identified to evaluate which materials should be considered principal threat and therefore, should be included within the limits of the OU1 remedial target area (RTA):

- If LNAPL greater than 0.01ft is present in a piezometer, then the location should be included within the OU1 principal threat RTA. This criteria is based on the New Jersey Department of Environmental Protection (NJDEP) Site Remediation Program Light Non-aqueous Phase Liquid (LNAPL) Initial Recovery and Interim Remedial Measures Technical Guidance, June 29, 2012, Version 1.2.
- If the material at a location fails the RCRA characteristics, then the location may be included within the OU1 principal threat RTA (determination to be made after completion of field work based on review of entire data set).
- Additional criteria may be defined by the USEPA, USACE, and CH2M HILL project team based on shared field investigation observations and results.

The approach for collecting the needed information will include the following document updates and task elements:

- Update the following OU1 planning documents to reflect the revised PDI activities:
 - Uniform Federal Policy - Quality Assurance Project Plan (UFP-QAPP; including all associated sampling procedures)
 - Contractor Quality Control Plan (CQCP)
 - Health and Safety Plan (HASP)
 - Site Management Plan (SMP)
- Prepare subcontractor scopes of work and procure subcontractors for the needed services, facilities, and supplies.
- Mobilize field facilities, equipment, and supplies.
- Complete the PDI:
 - Prepare the Site for the PDI activities (clear vegetation, build temporary roads).
 - Complete an exploratory test pitting program to investigate sludge materials and unknown materials observed during previous test pitting activities at the Site.
 - Install soil borings and piezometers to collect the information needed to define principal threat materials and establish the limits of the RTA.
 - Survey investigation locations.

- Collect 3 quarterly events of water levels and LNAPL thickness measurements from all wells and piezometers (permanent and temporary).
- For each of the 3 monitoring events, collect 1-month of continuous water level data in select monitoring wells without LNAPL using pressure transducers.
- Investigation-derived waste (IDW) management, characterization, and disposal.
- Collect one round of groundwater samples from all 27 monitoring wells at the Site.
- Complete the following data analyses and reporting activities following completion of the field investigation activities:
 - Sample analysis.
 - Analytical support and data usability evaluation.
 - Data evaluation which will include preparing figures and tables presenting the results, and data evaluation.
 - Prepare a draft and final Pre-Design Investigation Technical Memorandum presenting the results and recommendations for path forward.

3.0 Detailed OU1 PDI Scope of Work

The work-breakdown structure utilized in this revised Work Plan corresponds to the work-breakdown structure in the SOW received from the USACE and used in the initial Work Plan approved in August 2010. This revised Work Plan identifies the activities that will be completed under each task / subtask based upon the scoping discussions that were held.

The level of effort and expenses to implement the work in this Work Plan will be presented in a separate cost proposal.

The subcontract and outside services costs in the cost proposal will be based on estimated costs gathered recently for other nearby sites as well as the costs gathered for the preparation of the initial Work Plan cost proposal and applying an annual escalation of 4 %. These costs may differ from the final subcontractor / vendor costs, which will be available only after prospective bidders review site conditions and formal competitive bids are received and awarded. We will inform the USACE and USEPA of any differences between the budgeted subcontractor and outside services costs and those received from prospective bidders.

It is assumed that field activities will be performed in modified Level D and that there will be no delays because of site access, weather, subcontractor equipment problems, unusual subsurface/geologic conditions, or other conditions outside the control of CH2M HILL.

For the purposes of estimating the level of effort for field activities, field days have been assumed to have a 12-hour duration. The activities identified to be performed under each task and the estimated level of effort are included in the cost proposal attachment.

Work Order 1 (WO1) - Project Planning and Administration

Meetings and Site Visits (01.01)

Site Visits (01.01.01)

Two site visits are included with their timing to be determined in consultation with the USEPA and USACE. Three representatives from the project team are planned to attend each site visit [project manager, PDI Lead, and Field Team Lead (FTL)]. The site visits are assumed to require up to 8 hours for each team member including preparation for the visit and travel and 8 hours of follow-up for the PDI Lead.

Monthly Teleconferences (01.01.02)

Twelve monthly teleconferences are included with their timing to be determined in consultation with the USEPA and USACE. The calls are assumed to be attended by the project manager, PDI Lead, and FTL. Each attendee is estimated to need 1 hour to prepare for the call, one hour to attend the call, and 1 hour for follow-up and minutes.

Technical Approach Meetings (01.01.03)

Two technical meetings are included with their timing to be determined in consultation with the USEPA and USACE. These meetings are planned to take place at USEPA offices in New York City and are assumed to be attended by the project manager, PDI Lead, and FTL. Each attendee is estimated to need 8 hours for roundtrip travel and to attend the meeting. Preparation for the meetings and follow-up are assumed to require 4 hours each for each attending member.

Project Management and Administration (01.02)

Project Management (01.02.01)

This revised Work Plan includes the monthly management activities for 14 months from November 2012 through end of December 2013. The basis for the estimated monthly labor hours is assumed to be as approved in the initial Work Plan.

Monthly Reports (01.02.02)

This revised Work Plan includes the monthly reports for 14 months from November 2012 through end of December 2013. The basis for the estimated monthly labor hours is assumed to be as approved in the initial Work Plan.

Schedule (01.02.03)

This revised Work Plan includes schedule updates for 14 months from November 2012 through end of December 2013. The basis for the estimated monthly labor hours is assumed to be as approved in the initial Work Plan.

Design Data Needs Identification & Technical Planning (01.03)

Technical Memorandum (01.03.01)

After the remedial target area and principal threat area is defined, this subtask includes performing a desk-top evaluation of the potential application of the stabilization technology on principal threat materials including developing order of magnitude cost estimates. If the costs for excavation, stabilization, and on-site disposal are lower than the costs for

excavation, stabilization, and off-site disposal, the team may decide to consider further evaluation of the technology and this approach, including potential bench scale studies.

This subtask includes time for CH2M HILL to participate in a discussion with the USEPA and USACE on the specific objectives and technical approach for the evaluation, participating in a site visit, and performing a desk top evaluation. The evaluation will be initiated only after approval from the USACE to move forward and should be performed after the definition of what is considered a principal threat material.

The primary focus of this evaluation would be to assess reagent types and dosing and their competing constraints based on site specifics with the overall goal being to identify and bracket potential mix designs and associated costs that apply based on the established objectives and site materials.

The following describes the activities.

Site visit

CH2M HILL's S/S technical lead will visit the site to review site conditions, constraints, obstructions, access, and layout, and consider whether / how S/S may apply in different areas of the site.

During the site visit and subsequent activities, we will consider whether S/S is technically and operationally feasible at the Diamond Head site and how it can be integrated into the overall site remedial approach. For example, S/S may be applied alone or as a part of an integrated site strategy that may present a more cost effective solution.

As an example of integrating additional solutions with S/S application, in-situ S/S will likely not be feasible at the Diamond Head site due to site obstructions / concrete debris/ old foundations. Ex-situ application may be feasible and would require excavation of materials including the concrete debris; this debris could be decontaminated, crushed onsite, and used as a construction subgrade material. Also, the option of grinding the concrete and its application as part of S/S can be considered.

Another example would be the use of low doses of traditional soil stabilization reagents to create a moderate strength soil-cement (similar to highway projects) for use as a subgrade or site construction material. Alternatively, the material could be compacted and placed in a lined, onsite disposal cell.

Considerations of S/S Application and S/S-specific Objectives and Performance Criteria

Important considerations for S/S applications include the specific remedial objectives to be achieved, primary and secondary COCs to be addressed, various metrics that may affect application (e.g., materials use, handling, system operation), direct and indirect costs, and regulatory requirements.

In order to evaluate S/S application, it is important to define the S/S-specific objectives and the criteria that will be used to assess the attainment of these objectives. For example, will the treatment criteria be prescriptive, performance-based, or statistical in nature that allow for sample variability and a fixed percentage of failures? Additionally, will the S/S operations

and results be evaluated using single point values tests (TCLP, SPLP), using a long term leaching tests (ANSI 16.1), or a risk-based standard based on the testing of S/S specimens themselves or at some point of compliance.

Each of these approaches has different advantages and disadvantages and these attributes must be weighed against the remedial objectives to establish achievable criteria that are both meaningful and realistic.

To discuss the above with USEPA and USACE, the scope includes a meeting to be attended by CH2M HILL's S/S technical lead, the project manager, and RI lead. We have assumed that the meeting will be held at USEPA's offices in New York City.

We have also included 3, 1 hour follow-up calls for the same team to set common goals for the evaluation.

Review of existing site data

The information on principal threat material and COC concentrations and their distributions will be reviewed so that the considered S/S approach and applicable criteria make sense against the site specifics – site setting and objectives. COCs requiring S/S may differ across the site, which will affect the applicability of the technology and corresponding reagent dosing. In conjunction with other considerations, this review will support considerations of where samples may be collected in the future should S/S move to subsequent evaluation phases (e.g., bench scale / pilot testing). This review will also support the evaluation of whether S/S should be considered as a standalone application or can be leveraged as part of a treatment train (some examples provided above).

Literature Review and Vendor Information of Potential Mix Designs

S/S is a mature technology; it can be tailored to many different site conditions, and offers flexibility. That said, performing a literature review may appear a straightforward activity, but the literature is not well populated with detailed case studies of successful mix designs for NAPL and multiple contaminants. This makes the desk-top identification of potential mixes, their types of deployment and associated costs, challenging and data gaps are expected. Much of the mix design information is considered proprietary by specialty S/S construction firms. In order to assess what dosing and processing schemes may apply to the materials at the Diamond Head site, we propose to hold informal discussions with a few specialty firms, sharing with them key site data (without site name) so they can offer insight into treating the specific combinations of COCs at the Diamond Head site.

The S/S process, equipment, and labor needs are generally straightforward and pricing for these would be readily available in the northern New Jersey region. Therefore, the focus of the evaluation to be performed would be S/S application for NAPL and other COCs. Some S/S reagents are very expensive, for example, a 1% dose can be up to \$50/CY treated soil, reagent price only. At a 4% dose (possible for NAPL, depending on its composition), the S/S may be cost prohibitive.

A TM will be prepared summarizing the gathered information.

Work Order 2 (WO2) - Pre-Design Field Investigation and Sample Analysis

Mobilization and Demobilization (02.01)

Identify Field Support, Equipment, Supplies (02.01.01)

This subtask includes the following:

1. Coordinating with the suppliers the delivery of the procured field facilities and services.
2. Coordinating with the suppliers technical requirements for the duration of the field investigation.
3. The costs of the field support facilities and services for the duration of the field investigation.

The field facilities and services listed below will be provided for the estimated duration of field activities including mobilization and demobilization time (estimated at 4 months). This subtask includes the costs for the following facilities and services.

- Trailer and storage box
- Field sanitary facility
- Trash service
- Wireless internet service
- Generator for the trailer electricity supply and fuel for the generator
- Licensed electrician to connect and disconnect trailer to generator
- Sampling / monitoring equipment and supplies

All of the above will be provided through rental agreements.

A 20-CY roll-off dumpster will be rented for the storage of IDW from the soil boring installation. Decontamination and purge groundwater will be accumulated in a 6,500-gallon storage tank. The rental costs for the roll-off and tank are included with the subcontractor IDW transport and disposal costs under the soil boring and piezometer installation task. Final cleanout and disposal of accumulated sediment in the tank is also included in the cost proposal.

A Property Control Representative (PCR) will be designated on the project. The PCR will be responsible for maintaining the documentation on purchases in conformance with the operating procedures for government property administration established by the Federal Acquisition Regulation (FAR) Part 45 – Government Property and CH2M HILL's approved Government Property System. A camera and printer were purchased for a prior work on the project and will be used during the OU1 PDI. CH2M HILL will maintain an equipment inventory and provide this inventory to the USEPA and the USACE. Information on the inventory will include item description, model, serial number, and purchase price.

Mobilization (02.01.02)

This subtask includes the following:

1. Overseeing the delivery of the field support facilities and services to the site
2. Overseeing the electrical connection for the field trailer
3. Setting up the field trailer

4. Identifying, assembling, loading, transporting, unloading, and arranging the equipment at the Site for each of the identified field events

The following events are estimated to require equipment preparation, although where practicable, the preparation for the field events will be combined to increase efficiency:

- 1) Exploratory test pitting and sampling
- 2) Vegetation clearance and site preparation activities
- 3) Installation of soil borings and temporary piezometers and sampling
- 4) Synoptic water level and LNAPL thickness measurements (3 individual events)
- 5) Continuous transducer water level monitoring (3 1-month long events)
- 6) Groundwater sampling

Demobilization (02.01.03)

This subtask includes demobilizing equipment and facilities from the Site at the end of the field investigation. Efforts will be made to remove facilities and disconnect services concurrently. The project files will be removed from the field trailer, brought to the CH2M HILL office in Parsippany, New Jersey, and organized for subsequent project work.

Pre-Design Investigation (02.02)

Site Preparation (02.02.01)

No activities included under this subtask. Site improvements will be performed under another task order and include the vegetation clearance and road construction. Figure 1 shows the site improvements.

Piezometer Installation (02.02.02)

Preparation

Preparation will include the following activities:

- Review of the project planning documents at the start of the soil boring and piezometer installation.
- Development of task-specific project instructions.
- Pre-bid site visit, bid clarifications, bid evaluation, negotiations: soil boring and piezometer installation, rental of IDW storage facilities and IDW transport and disposal, and laboratory services.

Note that one subcontract is planned to include all laboratory services not available or declined through the CLP / USEPA's regional laboratory (DESA). This subcontract will include all needed subcontracted analyses (RCRA characterization tests as well as groundwater MNA and discharge permit-specific analyses). Dioxin analyses are planned to be performed through the CLP.

Subcontract costs are included under this task for the soil boring and piezometer installation, rental of IDW roll-off and water storage tank, and IDW transport and disposal. Subcontracted laboratory costs are included under Task 4.

Implementation

Implementation will include the following activities:

- Subcontractor mobilization and set-up at the Site
- Installation and sampling of 70 soil borings and construction of 70 piezometers
- Collection of samples from the drill cuttings and the decontamination water for waste characterization for disposal purposes
- Quality and Health and Safety audits of the field activities
- Field sample management including sample bottle labeling and cooler packaging
- Subcontractor demobilization from the Site
- Transport of the generator at the end of every week to CH2M HILL's parking lot and return on Monday morning
- Preparation and review of the daily CQCP quality assurance forms
- Assembling the field documentation at the end of the event
- Preparation of soil boring logs and piezometer construction diagrams
- Preparation of CLP Case Reports (5 reports)
- Completion of the sample tracking sheet

The sampling activities are described in more detail below.

Soil Boring Installation and Sampling

Shallow borings and piezometers will be installed by a New Jersey licensed driller for the purpose of defining the limits of the RTA. The locations of the proposed soil borings / piezometers are shown on Figure 2. Table 1 lists the samples planned to be collected and the associated analyses. Subtask 4.1 identifies the analyses that are planned through subcontracted laboratories.

The planned soil boring / piezometer installation program is shown in Figure 2 and consists of the following:

- Install soil borings on an 85-foot grid and along transects on top of both the east and south berms. This approach will result in 56 locations on the grid and 14 locations along the transects on top of the berms or a total of 70 locations. If refusal is encountered while advancing a boring then the location will be off-set approximately 5-feet and reattempted. Up to 5 attempts will be made in the vicinity of the initial boring location including use of a solid drive-point to advance the boring through the obstruction (e.g. debris and concrete). If refusal is still encountered after 5 attempts then the boring will be omitted from the program and alternate options for this location will be discussed with USEPA/USACE (e.g. relocation of boring, installation of short piezometer screen, etc.).
- Install soil borings to the estimated depth of the clay layer [estimated 8 feet below ground surface (bgs) outside of the berms and estimated up to 28 feet bgs through the estimated thickness of the berms and up to the estimated depth of the clay layer beneath the berms]. Install the soil borings using direct push technology (DPT) equipment such as a GeoProbe™ rig. Record lithology at each location for the purpose of establishing the thickness of the berms (for locations within the berms) and the depth to the clay layer (at all locations).
- Collect samples from soil borings on the grid and on top of the berms as follows:

- At all locations – collect soil samples every 2 feet for the RCRA corrosivity characteristic (i.e. pH). A field screening 'shake test' that replicates the laboratory test method will be employed in the field to screen the samples.
 - At locations where sludge is observed – collect samples from the sludge layer. Up to 5 of these samples are initially planned for laboratory analyses. Additional collected samples will be labeled and maintained at the Site for a USACE/USEPA decision on whether to send for laboratory analysis. Samples will be sent for TCL and TAL analysis through the CLP and TCLP and ICR analyses through a subcontracted laboratory. It is noted that holding times may be exceeded for the additional samples that are collected and held at the Site pending the decision whether to analyze and that the exceeded holding time will result in "J – estimated" flag qualification of the data during data validation. This qualification is not anticipated to negatively impact the usefulness of the data for characterizing the sludge. In addition, the sludge samples will undergo the field pH test.
 - At locations where unknown materials are observed – collect samples from the unknown material. Unknown materials are generally defined as non-native, non-typical soil materials that may have an anthropogenic source. Examples of unknown materials previously observed at the site include the mottled yellow-green-purple clay-like materials with Play-Doh™ type consistency and brown spherical marble size materials. For the purposes of this investigation, unknown materials specifically exclude the petroleum-sludge material, construction debris, and municipal waste materials.
 - Up to 5 of these samples are initially planned for laboratory analyses. Additional collected samples will be maintained at the Site for a USACE/USEPA decision on whether to send for laboratory analysis. Samples will be sent for TCL and TAL analysis through the CLP and TCLP and ICR analyses through a subcontracted laboratory. It is noted that holding times may be exceeded for the additional samples that are collected and held at the Site pending the decision whether to analyze and that the exceeded holding time will result in "J – estimated" flag qualification of the data during data validation. This qualification is not anticipated to negatively impact the usefulness of the data for characterizing unknown materials. In addition, the unknown materials samples will undergo the field pH test.
 - Collect samples from soil borings along the transects on top of the berms as follows:
 - At 6 selected locations – collect up to 4 samples per soil boring. Three of the samples will be collected from the berm materials and the fourth will be collected from the materials beneath the estimated bottom of the berm. The sampled depths will be selected based on visual observations and field screening for contamination. Samples will be sent for TCL and TAL analysis through the CLP.
 - The 6 locations to be sampled are shown on Figure 2; four are on the east berm and two are on the south berm.
- East berm: PZ-36, PZ-48, PZ-66, PZ-77
South berm: PZ-87, PZ-90

- Perform waste profiling/characterization soil sampling during the installation of the soil borings on the planned sampling grid using a sequential approach with the initial characterization sampling performed at the start of soil boring installation activities.
 - Initial sampling – Begin soil boring installation in areas with worst expected contamination at the Site (8 locations) as follows:
 - 4 soil boring locations in the two areas with LNAPL in monitoring wells (2 in each – refer to Table 1 column “Initial Waste Profiling” for the soil boring location numbers and Figure 2 for locations).
 - 2 locations in the sludge lagoon area. Refer to Table 1 columns under sludge (TCLP and ICR column) and rows under sludge for the number of samples. Locations are not shown in Figure 2 since samples are to be collected from the backhoe bucket.
 - 2 soil boring locations on top of the berms, the location with the highest contamination based on historic analytical results (PDI boring PZ-75 located near historic boring SB-54) and the location nearest to the seep observed under the berm to the drainage culvert (PDI boring PZ-78 located near historic sample SWSD-35). Refer to Table 1 column “Initial Waste Profiling” for soil boring location numbers and Figure 2 for locations.

Samples will be sent for the following analyses: TCLP, ignitability, reactivity, and Total Petroleum Hydrocarbons (TPH -Purgeables; Gasoline Range Organics and Extractables; Diesel Range Organics and Oil Range Organics). (Note that samples for RCRA corrosivity are planned at all soil boring locations as described in an earlier bullet) Samples will be composited over the depth of the soil borings. The laboratory performing the analyses will be requested to run the TCLP samples on a 3-day turnaround time (TAT). The remaining analyses will be on standard TAT. The results of these initial TCLP waste characterization samples will be used to determine whether additional waste characterization samples need to be submitted for analysis around the initial locations.

- Subsequent sampling - will be used if the initial waste profiling/characterization results at a location are over the hazardous thresholds (for waste disposal purposes) for any TCLP analyte. Subsequent sampling will be for the same characterization parameters. Locations will be selected as follows:
 - Around each location over the TCLP hazardous thresholds on the sampling grid - collect samples from the four nearest locations on the sampling grid.
 - Around each location over the TCLP hazardous thresholds on top of the berms - collect samples from the two nearest locations.
 - Additional 12 locations are assumed to require 3 day TAT TCLP analysis.
- Repeat this “step out” waste characterization procedure until the results indicate that the materials are non-hazardous for waste disposal purposes.
- If the progress of the program necessitates that sampling proceeds close to locations that were sampled for waste profiling/characterization before their TCLP results are available, the soil samples will be collected for waste characterization (TCLP, ignitability, reactivity, and TPH) and send to the

laboratory for storage until the results from the 3 day TAT TCLP analysis become available and a determination is made whether these subsequent waste profiling samples should be analyzed. Samples beyond the 1st two step outs will be analyzed on standard TAT.

- If the results from the initial waste profiling/characterization are non-hazardous, then additional waste characterization sampling will not be performed and the on-hold, waste profiling/characterization soil samples will be discarded.
- The approach described above will require careful sequencing of drilling activities but allows for progressive focused characterization of the materials, and will minimize the number of analyses. Sampling will start at the designated initial locations, then move to the outer nodes of the grid which have the lowest potential of being hazardous and therefore would not be undergoing RCRA testing, while awaiting the results from the initial sampling. Sampling would move back to the areas around the initial locations if the results indicate that additional delineation is needed.
- Of note, during the remedial action, the disposal contractor will also need to collect waste characterization confirmation samples from a certain frequency of loads, based on the disposal facility requirements; however, the sampling described above is considered representative for purposes of profiling the waste stream and preparing the remedial design budget.
- Depending upon soil core recovery (e.g., amount of debris, etc.) it may be necessary to collect additional MacroCore core sleeves at an immediately adjacent location and equivalent depth in order to obtain sufficient soil volume to support the necessary analytical sampling. If additional cores are required, then a solid drive point may be advanced directly to the target depth before resuming coring activities.

The following describes the drill rig and tooling planned for the soil boring installation:

- A direct push technology (DPT) rig will be used for installing soil borings, collecting continuous soil cores for geologic observations and soil sampling, and installation of temporary piezometers.
- Conventional soil coring MacroCore barrels will be used for geologic observations and collection of soil samples using acetate liners.

We have assumed that there will be no unusual conditions that would prevent rig access from the constructed roadways. Soil cores will be collected using dedicated acetate liners and the entire length of each core will be screened using a FID/PID and continuously logged describing soil characteristics in accordance with the Unified Soil Classification System (ASTM 1586D).

This task also includes collecting samples from the IDW for characterization for disposal purposes. The following are planned:

- One composite sample of the drill cuttings for TCLP and ICR through a subcontracted laboratory.

- One composite sample from the IDW water for TCL and TAL through CLP and for ICR through a subcontracted laboratory.

The analyses are planned through the following laboratories:

- CLP - TCL and TAL lists (including mercury and cyanide) and dioxins
- Subcontracted laboratory or DESA – TCLP, ICR, and TPH [Purgeables; Gasoline Range Organics and Extractables; Diesel Range Organics and Oil Range Organics (g and d&o)]

It is estimated that 100 coolers packed with soil samples will be sent for laboratory analysis. Each cooler will have its own chain of custody/ trip report. Because it has been found that the purchase cost of coolers is less expensive than return shipping costs for empty coolers from the laboratory, it is assumed that coolers will be used once and not returned to the site. This task therefore does not include the return shipping costs for any coolers.

A summary of the OU1 PDI activities is provided in Table 1.

Temporary Piezometer Installation

All soil borings will be converted into temporary piezometers. The purpose of the piezometers is to observe for the presence of LNAPL and variation in groundwater elevation and LNAPL thicknesses over 3 quarterly events.

Note that to maintain the temporary piezometers for this time period, it is assumed that the USEPA will coordinate with the NJDEP for exemption to the requirements of NJDEP Well Permit and Alternative Ground Water Sampling Techniques (AGWST) Guidance. It is therefore assumed that well permits will not be required for any aspect of this work (shallow borings or temporary well points). Alternatively, to maintain the temporary piezometers for more than 24-hours, fully constructed monitoring wells would need to be constructed and a permit obtained for each well. Based on discussions with USEPA, obtaining permits was not included in the initial Work Plan and is therefore, not included in this revised Work Plan.

The piezometer installation will consist of placing a pre-measured and pre-assembled piezometer in the bore holes after the soil boring target depths are reached and soil boring activities are complete. If the hole collapses after downhole tools are removed then a nominal two-inch casing or drill rod will be used to reopen the hole to the required depth so that the piezometer can be properly installed. If borehole collapse is a persistent issue, then use of temporary DPT casing to isolate the borehole (double cased DPT advancement) may be used.

Piezometer screens will be one-inch diameter, bottom capped, Schedule 40, polyvinyl chloride (PVC), 0.020-inch (20 slot), machine-slotted screens which will need to be measured prior to installation so that the screen extends from the bottom of the boring to 1-foot below ground surface so that it is straddling the water table. Well riser pipe will be flush threaded to the screen and will consist of one-inch, Schedule 40, PVC riser pipe extending to at least 3 feet above the ground surface. PVC materials will be available in 5-foot lengths to facilitate construction of the piezometers. The opening/top of the riser pipe will be capped with a 1-inch PVC slip cap after piezometer installation is complete. The annulus around the well screen will be gravity filled with # 2 sand (compatible with 20-slot screen) to a depth corresponding to 6-inches above the top of the screen. The remaining

annular space will be filled with granular bentonite that is gravity emplaced to ground surface and hydrated. Piezometer installation activities will be performed under CH2M HILL oversight.

The piezometers will not be developed as analytical groundwater sampling is not planned.

Removal and abandonment of the temporary piezometers is proposed to occur during the construction of the proposed remedy. Costs for piezometer abandonment are not included in this Work Plan.

The installation and sampling of the soil borings and the installation of the piezometers is estimated to require 14 days for 3 people. Four one-day site visits by the PDI Lead are included under this task. Collecting samples for disposal is estimated to require 1/2 day for 1 person. Two days are allowed also for the subcontractor to set-up and remove their equipment from the Site. Rental of the IDW storage is estimated at 4 months.

Surveying (02.02.03)

This subtask is to establish the sampling grid for the installation of the soil borings / piezometers (Initial survey activities) and then obtain actual horizontal coordinates and vertical information for the installed piezometers (Final survey activities). Vertical information will allow for water level information to be used for plotting groundwater elevations if this is desired.

Preparation

Preparation will include the following activities:

- Development of task-specific project instructions.
- Development of technical specifications for the survey subcontract and technical support during procurement (pre-bid site visit, bid clarifications, bid evaluation, negotiations).

Subcontract costs for the survey subcontract are included under this task.

Implementation

Implementation will include the following activities:

- Subcontractor mobilization and set-up at the Site.
- Oversight of the survey activities.
- Preparation and review of the CQCP forms.
- Plotting the survey locations onto the base map and entering the survey information into the project database.

The surveyor will perform the following activities:

Initial survey – To be performed after vegetation clearing and before road construction

- Establish a sampling grid at 85 feet spacing over the area shown in Figure 2.
- Establish two transects along toe and crest of the South berm with 7 nodes per transect at same 85 foot spacing as the grid.

Final survey

- Survey the horizontal coordinates and vertical elevations of the installed piezometers and soil borings.

Oversight of the survey subcontractor is estimated to require 3 days for 1 person for the initial survey activities and 4 days for 1 person for the final survey activities.

In addition to the subcontracted survey services, CH2M HILL will rent a GPS unit prior to site preparation activities to mark the approximate layout of borings and roadways through the wetland/sludge lagoon area to guide the vegetation clearing and road construction activities.

Water Level and LNAPL Measurements (02.02.04)

This subtask includes:

- Collecting three complete quarterly rounds of water levels and LNAPL thickness measurements from the new temporary piezometers as well as from the monitoring wells and piezometers currently situated within the physical boundaries of the Site. Table 2 lists all previously existing wells and piezometers and the newly planned piezometers where the measurements will be collected. (note that the table also identifies the wells suggested for sampling in support of the discharge permit)
- Collecting three 1-month continuous water level data monitoring sets using pressure transducers installed at four well locations selected as follows: locations MW-10S, PZ-17, and MW-15S selected to triangulate data across the site and the fourth location, MW-14S, selected to capture the characteristic groundwater mounding frequently observed in the center of the Site.

Preparation

Preparation will include the following activities:

- Development of task-specific project instructions.
- Expanding the current spreadsheet used to record water levels and LNAPL thickness measurements to include the newly installed piezometers.

Implementation

Implementation will include the following activities:

- Review of the project planning documents at the start of the task.
- Collecting three complete rounds of water levels and LNAPL thickness measurements from 27 wells, 16 existing piezometers, and 70 new piezometers.
- Preparation and review of the CQCP forms.
- Completion of an Excel worksheet with the collected data.
- Preparation of two graphs for each of the piezometer locations showing changes over time – one showing LNAPL thickness and the other showing groundwater elevations.
- Preparation of 6 figures showing LNAPL thickness and water level contours for the three monitoring events.
- Procure rental pressure transducers and program the transducers with the required information for the sampling program.
- Deploy and activate the transducers in the selected monitoring wells.

- Return to the site after two weeks to download the collected data and verify proper operation.
- Return to the site at the end of the 4 week monitoring period and download the collected data and retrieve the pressure transducers.
- Decontaminate the transducers, delete site specific data from the datalogger memory, and return the transducers to the vendor.
- Perform post-processing of the water elevation data and generate hydrographs for each well.

For each monitoring event, three CH2M HILL staff will work together to obtain the data set in the shortest amount of time practicable (estimated at 1 day). Measurements will be collected using oil/water interface probes. Data will be corrected as appropriate for the presence of LNAPL.

Collecting each set of continuous water levels is estimated to require 3 field days for a 2 person team to install the instruments, check them at week two, and remove them at week four.

Groundwater Sampling (02.02.05)

The objectives of this task are to obtain recent groundwater data for the following:

- Support a permit application for the discharge of water to a public water treatment works should dewatering be needed during remedy construction.
- Obtain one round of groundwater samples that would represent baseline groundwater conditions before remedy implementation.
- Obtain additional data on the physical characteristics of groundwater conditions.

The data planned to be obtained will include permit specific analyses that were identified during conversations with the Kearny Municipal Utilities Authority (KMUA) and Passaic Valley Sewerage Commissioners (PVSC) during the preparation of the completed OU1 focused FS. Before proceeding with the groundwater sampling, we will contact the KMUA and PVSC to confirm the permit-required analyses and explore whether analyses for TCL and TAL of the groundwater samples can be used in place of Total Toxic Organics (TTO) analyses.

The following wells are considered for sampling in support of potential permit application: MW-2S, 3S, 7S, 9S, 11S, 12S, 13S, and 14S and PZ-14, 15, 16, and 17. These wells / piezometers are located east of the landfill and may be within the footprint of the RTA.

Figure 3 shows the locations of the monitoring wells to be sampled.

Preparation

Preparation will include the following activities:

- Review of the project planning documents at the start of the groundwater sampling.
- Development of task-specific project instructions.

Implementation

Implementation will include the following activities:

- Set-up at the Site.
- Collection of groundwater samples from 27 monitoring wells (including wells above and below the peat) and including monitoring wells with NAPL occurring in the well (assumed to be MW-13S and MW-3S). The same field procedures will be used as were used during the OU2 investigation to minimize the interference of the NAPL with collecting an undisturbed groundwater sample.
- Sample management including sample bottle labeling and cooler packaging and preparation of associated paperwork including use of SCRIBE.
- Transport of the generator at the end of every week to CH2M HILL's parking lot and return on Monday morning
- Assembling the field documentation at the end of the event.
- Preparation and review of the CQCP forms.
- Preparation of CLP Case Reports (4 reports).
- Completion of the sample tracking sheet.

The planned analyses are as follows:

- 1) Baseline groundwater conditions: Samples collected from 27 existing wells for TCL and TAL (total and dissolved).
- 2) Discharge permit to KMUA and PVSC: Samples collected from a subset of the wells (12) for the following:
 - Biological Oxygen Demand (BOD)
 - Total Suspended Solids (TSS)
 - pH (field measurement)
 - TPH [Purgeables; Gasoline Range Organics and Extractables; Diesel Range Organics and Oil Range Organics (g and d&o)]
 - Total Toxic Organics (TTOs)
- 3) Physical groundwater conditions: Samples collected from 27 existing wells for the following MNA parameters:
 - alkalinity
 - total suspended solids (TSS)
 - total dissolved solids (TDS)
 - hardness
 - total iron
 - dissolved iron
 - ferrous iron (field HACH test)
 - dissolved arsenic
 - ammonia
 - total nitrogen (TKN)
 - nitrate
 - nitrite
 - calcium
 - potassium
 - manganese
 - phosphorous

- total sodium
- chloride
- sulfate
- sulfide
- TOC
- biological oxygen demand (BOD)
- chemical oxygen demand (COD)

The analyses are planned through the following laboratories:

- CLP - TCL and TAL lists (including mercury and cyanide).
- Subcontracted laboratory or DESA – TTOs, BOD, TSS, TPH (g and d&o), and all MNA parameters.

For the purposes of budgeting, in case TCL and TAL in lieu of TTOs analyses are not acceptable to the KMUA and PVSC, this Work Plan includes the costs for laboratory analyses for TTOs of 12 groundwater samples.

It is estimated that 128 coolers packed with groundwater samples will be sent for laboratory analysis. Each cooler will have its own chain of custody/ trip report. It is assumed that groundwater sampling will occur over 4 consecutive CLP cases. A case report will be generated for each of the cases. Because it has been found that the purchase cost of coolers is less expensive than return shipping costs for empty coolers from the laboratory, it is assumed that coolers will be used once and not returned to the site. This task therefore does not include the return shipping costs for any coolers.

Groundwater sampling is estimated to require 15 days for 3 people.

Investigation-derived Waste (02.02.06)

The objectives of this subtask are to characterize the generated wastes for disposal and arrange for and oversee their removal from the Site for transport to an offsite disposal facility.

Preparation

Preparation will include the following activities:

- Review of the analytical results and preparation of a recommendation to the USEPA on the classification of the wastes.
- Verification of the permits for the transporter and disposal facilities and coordination of USEPA pre-approval of the facilities.
- Preparation of waste profiles and manifests and manifest tracking.

Implementation

Implementation will include the following activities:

- Field oversight of subcontractor
- Preparation and review of the CQCP forms

Investigation derived waste will be containerized and managed onsite for ultimate manifesting and disposal at USEPA-approved off-site disposal facilities. Waste streams will include personal protective equipment (PPE), decontamination fluids, drill cuttings and acetate sleeves from soil boring installation, groundwater, used soiled drums and general trash. Based on historic data from previous investigations, it is assumed that all waste streams will be non-hazardous. Estimates of the quantities of each waste stream expected to be generated are provided below. For efficiency, solid materials from the drilling program will be commingled and containerized in a roll-off dumpster for bulk disposal. At the conclusion of the drilling program, the roll-off will be removed from the Site. Incidental amounts of PPE generated during the subsequent groundwater sampling and water level measurement events will be containerized in 55-gallon drums. Fluids from the drilling program and groundwater sampling will be containerized in a storage tank rented for the duration of the program.

Summary of IDW Waste Streams			
Waste	Disposal Classification	Container Type	Estimated Quantity
PPE from groundwater sampling & water levels after roll-off removed from site	Non-Hazardous	55-gallon drums	5 drums
Soil with commingled drilling IDW / PPE	Non-Hazardous	20-CY roll off box	11 CY / 7 tons
Decontamination fluids and well purge water	Non-Hazardous	Storage tank	850 Gallons

It is assumed that the waste characterization sampling described in the Work Plan will be sufficient for the purpose of the wastes being accepted for disposal. At the time of requesting bids, the sampling requirements for the disposal facilities that bidders propose to use will be requested. If additional sampling is needed to meet these requirements, the proposed sampling will be modified and the USEPA and the USACE informed. These results of the proposed waste characterization sampling will be supplemented by the sampling results from previous investigations.

Oversight of the removal of the wastes from the Site for disposal is estimated to require 1 day for 1 person.

Sample Analysis (02.03)

Sample Analysis (02.03.01)

Laboratory analyses will be performed through both CLP/DESA labs and possibly subcontracted laboratories. The table below summarizes the planned analyses. This

subtask does not include labor hours but does include laboratory subcontract costs for the subcontracted analyses summarized below.

Some analyses in the list below may be performed by DESA depending on availability of laboratory space. A forecast of the types and number of planned analyses was previously provided to DESA to determine space availability. As recommended by DESA, this Work Plan assumes that the samples will need to be analyzed by a subcontracted laboratory. Prior to the beginning subcontracting activities, the DESA laboratory will be contacted again to request a current determination of space availability.

Matrix	No of samples	Duplicates (1/20)	MSMSD (1/20)	Equipment Blank (1/event)	Trip blanks	Total
Test Pits						
Sludge for chemical characterization and waste profiling						
Unknown materials for chemical characterization and waste profiling						
Sludge and unknown materials for RCRA pH (field analysis)						
TCL	30	2	2	2		36
TAL	30	2	2	2		36
TCLP *	30					30
ICR *	30					30
Dioxins	30	2	2	2		36
TPH *	30					30
Field analysis of pH	30					30
Sludge Lagoon						
Sludge for chemical characterization and waste profiling						
Sludge for RCRA pH (field analysis)						
(assume QA/QC combined with samples from test pits)						
TCL	2					2
TAL	2					2
TCLP * (3 day TAT)	2					2
ICR *	2					2
Dioxins	2					2
TPH *	2					2
Field analysis of pH	2					2
Soil Borings (sampling grid and on top of berms)						
Soil for RCRA pH (field analysis)						
Field analysis of pH	460					460

Matrix	No of samples	Duplicates (1/20)	MSMSD (1/20)	Equipment Blank (1/event)	Trip blanks	Total
Soil Borings Sludge, if encountered in soil borings for chemical characterization and waste profiling Unknown materials, if encountered in soil borings for chemical characterization and waste profiling (QA/QC combined with soil borings on top of berms)						
TCL	10					10
TAL	10					10
TCLP *	10					10
ICR *	10					10
Field analysis of pH	10					10
Soil Borings Soil from select borings for waste profiling						
TCLP * (3 day TAT)	18					18
IR *	18					18
TPH *	18					18
Soil Borings Soil from select borings on top of the berms for chemical characterization						
TCL	24	2	2	2		30
TAL	24	2	2	2		30
Groundwater - Includes the following samples: 27 (all) monitoring wells for chemical characterization 12 monitoring wells for information in support of permit application if needed						
TCL	27	4	4	4	4	43
TAL total	27	4	4	4		39
TAL dissolved	27	4	4	4		39
MNA parameters*	27					27
Permit *	12					12
IDW Disposal						
TCL liquid	1					1
TAL total liquid	1					1
TCLP solid *	1					1
ICR solid *	1					1
ICR liquid *	1					1

TCL, TAL, and dioxin analyses through CLP.

* Indicates analyses through DESA or subcontracted laboratory; soil samples from soil borings and sludge lagoon for waste profiling to be analyzed for TCLP on 3 day TAT. Total number of samples for 3 day TAT analyses is 20.

Equipment blanks are collected at the frequency of 1 per decontamination event. Decontamination event is an event when reusable equipment is decontaminated prior to use.

Sample Management (02.03.02)

This subtask includes the sample management for the samples planned as part of the OU1 PDI activities (see table above for summary and Table 1 for a complete list). The following activities are included:

- Establish and maintain sample tracking system.
- Prepare sample paperwork (Scribe database upload) and other pre-packaging and pre-labeling ahead of the start of the field events.
- Provide USEPA's Sample Management Officer (SMO) with forecasts of the expected number of samples and analyses at the start of each of the following events: test pitting, soil sampling, and groundwater sampling.
- Coordinate with CLP SMO during analysis.
- Coordinate with subcontract lab.
- Prepare ANSET reports for the samples analyzed outside of the CLP.
- Review the hard copies of data packages and resolve outstanding issues related to qualifiers (for example, often the validated reports do not indicate which of two duplicate / re-extracted analyses performed by the laboratory on the same sample should be used for reporting; this requires review of the laboratory data package by a chemist in order to resolve).
- Review the hard copies of the validated data packages for each case versus the electronic files and correct inconsistencies in the results.
- Coordinate with USEPA and subcontracted laboratories regarding analytical, data validation, and quality assurance issues.

Data Evaluation (02.04)

Data Usability Evaluation (02.04.01)

CH2M HILL chemist will review the results of chemical analyses to evaluate the usability of the data. Groundwater samples analyzed through CLP will also be validated through the CLP program. Formal validation of the remaining analyses is not included.

Data Reduction, Tabulation, and Evaluation (02.04.02)

This subtask includes the management and technical evaluation of the collected data.

The results of TCL and TAL analyses of the following media will be imported into the existing EQuIS 3 project database management system: berm characterization, sludge (from test pits, soil borings, and sludge lagoon), unknown materials (from test pits and soil borings), and groundwater. We have assumed that the results for samples analyzed through CLP as part of this remedial investigation will be provided as Lotus-based electronic files (same format as previous files), which can be imported directly into EQuIS, the existing database management system. Data is assumed to be received from a CLP laboratory and DESA and is assumed to be uploaded during two events – one after all the solid matrix analyses are received and one after the groundwater analyses are received. This Work Plan does not include estimated costs for upgrading to EQuIS 5 and for manual data entry if data is not available electronically. If desired, we will prepare an estimate of these costs.

The results of the remaining analyses are assumed to be managed in Excel. During subcontract laboratory procurement, a tabular format will be provided to the bidders and results will be requested in this format from the laboratory. The tables will undergo some formatting but it is assumed that data entry and import into EQuIS will not be performed.

Boring logs and temporary piezometer construction diagrams will be prepared but because of their temporal nature (to be removed at the start of construction), they are not planned to be imported into the project database.

The following deliverables are assumed to be produced during this task:

- Tables
 - Summary of collected samples.
 - Analytical results for the following:
 - Soil materials - pH
 - Sludge material (from sludge lagoon, test pits, and soil borings) – *TCL*, *TAL*, dioxins, *TCLP*, and *ICR*
 - Unknown materials (test pits and soil borings) – *TCL*, *TAL*, dioxins, *TCLP* and *ICR*
 - Berm characterization – *TCL and TAL*
 - Waste profiling– in-situ *TCLP*, reactivity, and ignitibility
 - Waste characterization – IDW soil ex-situ, for disposal, *TCLP* and *ICR*
 - Waste characterization – IDW water ex-situ, for disposal, *TCL and TAL*, and *ICR*

(Note – the tables to be generated from the database are italicized, the remaining tables are form Excel)

 - For tables presenting *TCL* and *TAL* results - Two sets of tables will be prepared – one showing all results (including U-qualifiers) and the second showing only detected concentrations and comparing them to applicable standards and criteria. It is assumed that the values for the standards and criteria will be as compiled in April 2012 at the start of preparation of the OU2 RI Report.
 - Statistical summary of the groundwater sampling results: table will be used to compare to the 2003 and 2009 groundwater sampling results. The table will include the following information for each detected compound: number of locations sampled, number of locations where compound was detected, number of locations where compound exceeded criteria, maximum concentration, location where maximum concentration was detected, and average concentration.
 - This task also includes generating the call-out boxes for the planned groundwater map.
- Maps / site plans
 - Map showing the locations of OU1 PDI sampling locations.
 - Map showing the layout of constructed roadways.
 - Map with call out boxes of groundwater results exceeding standards/criteria. The plot developed during the OU2 activities will be used and the call-out boxes replaced with boxes that include the results of this round of groundwater sampling.

- LNAPL thickness contour maps and groundwater elevation contour maps above the peat (6, one for each of 3 rounds of LNAPL thickness and groundwater elevation measurements).
- Graphs of seasonal variations in LNAPL thickness and groundwater elevations for all monitoring wells and piezometers.

This task also includes the cost to prepare an EQuIS deliverable of the groundwater analytical data that is in the project database. The project data is currently in EQuIS 3; the estimated costs are to prepare the Location, Sample, Test/Result tables deliverable. The deliverable will be provided to USEPA for upload.

Remedial Investigation Report (02.05)

Technical Memorandum (02.05.01)

A Technical Memorandum (TM) will be prepared to present the results from the PDI investigation. The TM is anticipated to have the following outline:

- Introduction
- Site Preparation
- Pre-Design Sampling Activities
 - Exploratory test pitting and sampling
 - Soil boring and piezometer installation and sampling
 - Water levels and LNAPL thickness measurements
 - Waste profiling/characterization sampling
 - Groundwater sampling
 - IDW sampling and management
- Sampling Results
 - LNAPL thickness measurements and seasonal variability
 - pH
 - Sludge materials (sludge lagoon, test pits, and soil borings)
 - Unknown materials (test pits and soil borings)
 - Berm characterization
 - Test Pit Observations
 - Waste profiling/characterization
 - Groundwater sampling results
 - Waste disposal
- Definition of Principal Threat
- Definition/Delineation of Remedial Target Area with estimated volume
- Conclusions and Recommendations
- Figures
- Tables
- Appendices:
 - A Standards and Criteria Used to Evaluate Sampling Results
 - B Soil Boring Logs and Piezometer Construction Diagrams
 - C Exploratory Test Pits Logs
 - D Groundwater Sampling Field Data Sheets
 - E Water Level and LNAPL Thickness Measurements

- F Analytical Results—CLP Analyses
- G Analytical Results—Analyses through Subcontracted Laboratory
- H Survey Information
- I Road Construction Details

Before beginning work on the project, CH2M HILL will prepare a detailed outline for USEPA and USACE review and approval. The CQCP checklist documenting senior review of the deliverable will be completed and maintained in the project files. The draft TM will be provided electronically through e-mail to the USEPA, USACE and NJDEP for review and one set of consolidated comments will be addressed. Based on past experience, minor comments on the draft report are assumed. Three hard copies of the final will be sent in the mail.

Work Order 6 (WO6) - Fee

The fee basis proposed based on weighted guidelines.

4.0 Schedule

An overall schedule for completing the OU1 PDI activities was developed in Microsoft Project and is attached as Figure 4. This schedule will be reviewed and statused monthly during the entire project. The estimated duration of the field activities through the end of the first continuous water level monitoring event is 4 months.

Tables and Figures

Table 1: Summary of OU1 PDI Activities

OU1 Pre-Design Investigation - Diamond Head Oil Superfund Site, Kearny, NJ

Description	Location	Coordinates (NJSP, NAD83)		Comment	Soil (1)	Sludge (2)					Unknown Materials (3)					Initial Waste Profil- ing (4)	Berms (5)	Groundwater				IDW Dispo- sal	
		Northing	Easting			Field pH	TCL, TAL	TCLP and ICR	TPH	Field pH	Dioxins	TCL, TAL	TCLP and ICR	TPH	Field pH			Dioxins	TCL, TAL	TCL - total & dissolved	MNA	Permit	TCLP
Exploratory Test Pits																							
Test Pit	TP-1			Sample sludge material and unknown materials		1	1	1	1	1	1	1	1	1									
Test Pit	TP-2			Sample sludge material and unknown materials																			
Test Pit	TP-3			Sample sludge material and unknown materials		1	1	1	1	1	1	1	1	1									
Test Pit	TP-4			Sample sludge material and unknown materials																			
Test Pit	TP-5			Sample sludge material and unknown materials		1	1	1	1	1	1	1	1	1									
Test Pit	TP-6			Sample sludge material and unknown materials		1	1	1	1	1	1	1	1	1									
Test Pit	TP-7			Sample sludge material and unknown materials		1	1	1	1	1	1	1	1	1									
Test Pit	TP-8			Sample sludge material and unknown materials		1	1	1	1	1	1	1	1	1									
Test Pit	TP-9			Sample sludge material and unknown materials		1	1	1	1	1	1	1	1	1									
Test Pit	TP-10			Sample sludge material and unknown materials		1	1	1	1	1	1	1	1	1									
Test Pit	TP-11			Sample sludge material and unknown materials		1	1	1	1	1	1	1	1	1									
Test Pit	TP-12			Sample sludge material and unknown materials																			
Test Pit	TP-13			Sample sludge material and unknown materials		1	1	1	1	1	1	1	1	1									
Test Pit	TP-14			Sample sludge material and unknown materials																			
Test Pit	TP-15			Sample sludge material and unknown materials		1	1	1	1	1	1	1	1	1									
Test Pit	TP-16			Sample sludge material and unknown materials																			
Test Pit	TP-17			Sample sludge material and unknown materials		1	1	1	1	1	1	1	1	1									
Test Pit	TP-18			Sample sludge material and unknown materials		1	1	1	1	1	1	1	1	1									
Test Pit	TP-19			Sample sludge material and unknown materials		1	1	1	1	1	1	1	1	1									
Test Pit	TP-20			Sample sludge material and unknown materials		1	1	1	1	1	1	1	1	1									
TOTAL						15	15	15	15	15	15	15	15	15									
Sludge Lagoon																							
Sludge Lagoon	SL-1			Backhoe into sludge area	1	1	1	1	1	1													
Sludge Lagoon	SL-2			Backhoe into sludge area	1	1	1	1	1	1													
TOTAL					2	2	2	2	2	2													
Soil Borings and Piezometers																							
Sampling Grid: - 56 Locations on 85	PZ-23	698270	593971	Sample all locations: - Every 2 feet for pH	4																		
	PZ-24	698270	594056		4																		
	PZ-25	698270	594141		4																		
	PZ-26	698270	594226		4																		

Table 1: Summary of OU1 PDI Activities

OU1 Pre-Design Investigation - Diamond Head Oil Superfund Site, Kearny, NJ

Description	Location	Coordinates (NJSF, NAD83)		Comment	Soil (1)	Sludge (2)					Unknown Materials (3)					Initial Waste Profi- ling (4)	Berms (5)	Groundwater					IDW Dispo- sal
		Northing	Easting		Field pH	TCL, TAL	TCLP and ICR	TPH	Field pH	Dioxins	TCL, TAL	TCLP and ICR	TPH	Field pH	Dioxins	TCLP, Ignitability, Reactivity, TPH	TCL, TAL	TCL	TAL - total & dissolved	MNA	Permit	TCLP	ICR
ft centers - Grid includes locations on top of East berm	PZ-27	698185	593971	- Sample sludge materials and unknown materials, and - Sample for waste profiling using step-out approach	4																		
	PZ-28	698185	594056		4																		
	PZ-29	698185	594141		4																		
	PZ-30	698185	594226		4																		
	PZ-31*	698185	594280		14																		
	PZ-32	698100	593971		4																		
	PZ-33	698100	594056		4																		
	PZ-34	698100	594141		4																		
	PZ-35	698100	594226		4																		
	PZ-36*	698100	594311		14												4						
	PZ-37	698015	593971		4																		
	PZ-38	698015	594056		4																		
	PZ-39	698015	594141		4																		
	PZ-40	698015	594226		4																		
	PZ-41	698015	594311		4																		
	PZ-42*	698015	594344		14																		
	PZ-43	697930	593971		4																		
	PZ-44	697930	594056		4																		
	PZ-45	697930	594141		4																		
	PZ-46	697930	594226		4											1							
	PZ-47	697930	594311		4																		
	PZ-48*	697930	594376		14												4						
	PZ-49	697845	593971		4																		
	PZ-50	697845	594056		4																		
	PZ-51	697845	594141		4																		
	PZ-52	697845	594226		4											1							
	PZ-53	697845	594311		4																		
	PZ-54*	697845	594396		14																		
	PZ-55	697760	593971		4																		
	PZ-56	697760	594056		4																		
	PZ-57	697760	594141		4																		
	PZ-58	697760	594226		4																		
	PZ-59	697760	594311		4																		
	PZ-60*	697760	594396		14																		
	PZ-61	697675	593971		4																		
	PZ-62	697675	594056		4	1	1		1		1	1		1									
	PZ-63	697675	594141		4	1	1		1		1	1		1									
	PZ-64	697675	594226		4	1	1		1		1	1		1									
	PZ-65	697675	594311		4																		
	PZ-66*	697675	594396		14												4						
	PZ-67	697590	594056		4	1	1		1		1	1		1									
	PZ-68	697590	594141		4	1	1		1		1	1		1		1							
	PZ-69	697590	594226		4											1							
	PZ-70	697590	594311		4											1							
	PZ-71*	697590	594374		14																		
	PZ-72	697505	594056		4																		
	PZ-73	697505	594141		4																		
	PZ-74	697505	594226		4																		
	PZ-75*	697505	594299		14											1							
	PZ-76	697420	594056		4																		
	PZ-77*	697420	594141		14												4						
	PZ-78*	697335	594056		14											1							
Locations on South berm - 14 on 85 ft centers	PZ-79	697299	593936	1) Sample all locations:	4																		
	PZ-80	697250	593867	- Every 2 feet for pH	4																		
	PZ-81	697201	593797		4																		
	PZ-82	697152	593728	- Sample sludge materials	4																		
	PZ-83	697103	593658	and unknown materials,	4																		

Table 1: Summary of OU1 PDI Activities

OU1 Pre-Design Investigation - Diamond Head Oil Superfund Site, Kearny, NJ

Description	Location	Coordinates (NJSP, NAD83)		Comment	Soil (1)	Sludge (2)				Unknown Materials (3)				Initial Waste Profi- ling (4)	Berms (5)	Groundwater				IDW Dispo- sal			
		Northing	Easting		Field pH	TCL, TAL	TCLP and ICR	TPH	Field pH	Dioxins	TCL, TAL	TCLP and ICR	TPH	Field pH	Dioxins	TCLP, Ignitability, Reactivity, TPH	TCL, TAL	TCL	TAL - total & dissolved	MNA	Permit	TCLP	ICR
	PZ-84	697054	593589	and	4																		
	PZ-85	697005	593519		4																		
	PZ-86*	697242	593980	- Sample for waste profiling using step-out approach	14																		
	PZ-87*	697193	593910		14											4							
	PZ-88*	697144	593840		14																		
	PZ-89*	697096	593771	2) Sample 6 locations for	14																		
	PZ-90*	697047	593701	characterization TCL and	14											4							
	PZ-91*	696998	593631	TAL	14																		
	PZ-92*	696949	593562		14																		
TOTAL					460	5	5	0	5	0	5	5	0	5	0	6	24						
Monitoring Wells																							
Groundwater (See Table 2 for list of Wells)	MWs	NA	NA	One round														27	27	27	12		
IDW																							
Drill cuttings	Roll-off	NA	NA	Composite sample																		1	1
Decon / Purge water	Frac Tank	NA	NA	Composite sample													1						1
TOTAL																	1					1	2
Total number of samples					462	22	22	17	22	17	20	20	15	20	15	6	25	27	27	27	12	1	2

NOTES:

General - Note that this proposal does not include test pitting and associated sample collection. This work will be performed under a separate task order. This proposal includes the laboratory analysis and reporting of samples collected from test pits.

(1)

Test pits and sludge lagoon: Samples from test pits and sludge lagoon will be sent for laboratory analysis for RCRA pH.

Soil borings: Samples for RCRA pH will be collected every 2 feet in soil borings. All samples will be field tested using the shake test. Samples with field results less than 2 or greater than 12 will be sent for laboratory confirmation. In addition, 1 sample per soil boring from the depth that appears to be most contaminated based on visual, will be sent for laboratory analysis for RCRA pH. Assumed that 10% of the soil boring samples will require confirmation (estimated 46 samples).

(2)

Sludge samples to be collected where observed in test pits (assumed upto 15), where observed in soil borings (assumed upto 5 sent to lab and remaining held for field decision on whether to analyze), and from the sludge lagoon (upto 2). Only sludge samples from the test pits and sludge lagoon will be analyzed for dioxins, the site is adequately characterized with these samples.

(3)

Samples from unknown materials to be collected where observed in test pits (assumed upto 15), and where observed in soil borings (assumed upto 5 sent to lab and remaining held for field decision on whether to analyze). Only unknown materials from the test pits will be analyzed for dioxins, the site is adequately characterized with these samples.

(4)

The Initial waste profiling locations are selected: two samples in each of the two areas of site where LNAPL is found in MWs (PZ-46, PZ-52, PZ-68, PZ-69) and at 2 locations on top of the berms (PZ-75, PZ-78 near oil seep). Follow-up delineation assumed to be needed around 2 locations in the LNAPL areas (8 samples) and at both locations on top of the berms (4 samples). These waste profiling samples will be composited over the depth of the boring. Samples will be analyzed for TCLP on 3 day turnaround time (TAT). Note that corrosivity is not performed because field pH testing is performed every 2 feet in all soil borings.

(5)

The characterization sampling in the berms includes 2 locations on top of the east berm and 4 locations on top of the south berm with 4 samples per location.

Yellow shading indicates that the locations where the "sludge" and "unknown material" samples will be collected are actually based on field observations where materials are encountered. It is assumed that five out of the twenty test pits will not have sludge or unknown materials to sample. Yellow cells are placeholders for budgeting and planning purposes.

* Indicates location on top of berms

NJSP, NAD 83: Coordinates in New Jersey State Plane coordinate system, North American Datum 1983

Denotes TCLP sample from initial waste profiling send for 3 day TAT analysis (8 samples). Note ICR and TPH are on standard TAT analysis. An additional 12 samples are assumed to be send for 3-day TAT during the 1st waste profiling step out.

Table 2: Synoptic Water Level and NAPL Thickness Measurement Locations

OU1 Pre-Design Investigation - Diamond head Oil Superfund Site, Kearny, NJ

Well ID No.	Top of Protective Steel Casing Elevation (feet)	Top of Inner PVC Casing Elevation (feet)	Comments
MW-1S	11.09	10.81	
MW-2S	12.27	12.06	
MW-3S	14.96	14.79	
MW-4S	18.26	18.06	
MW-5S	20.96	20.81	
MW-6S	11.04	11.15	
MW-7S	11.66	11.51	
MW-8S	N/A	N/A	Not Installed
MW-9S	14.00	13.94	
MW-10S	9.65	9.70	
MW-10D	10.02	10.07	
MW-11S	12.70	12.72	
MW-11D	12.46	12.40	
MW-12S	14.28	14.08	
MW-13S	12.36	12.54	
MW-13D	12.89	12.85	
MW-14S	15.20	15.17	
MW-15S	10.77	10.76	
MW-15D	10.77	10.77	
MW-16S	N/A	N/A	Not Installed
MW-17S	9.53	9.12	
MW-18S	10.14	9.84	
MW-19S	29.82	29.59	
MW-20S	27.52	27.16	
MW-21S	6.87	6.41	
MW-22S	N/A	N/A	Not Installed
MW-23S	7.38	6.64	
MW-24S	6.19	5.62	
MW-25S	15.25	14.76	
MW-26S	10.01	9.58	
PZ-1	15.29	15.25	
PZ-2	15.66	15.66	
PZ-3	15.77	15.69	
PZ-4	15.52	15.47	
PZ-5	15.47	15.01	
PZ-6	15.22	15.26	
PZ-7	16.53	16.51	
PZ-8	15.86	15.86	
PZ-9	15.6	15.57	
PZ-10	15.98	16.01	

Table 2: Synoptic Water Level and NAPL Thickness Measurement Locations
OU1 Pre-Design Investigation - Diamond head Oil Superfund Site, Kearny, NJ

Well ID No.	Top of Protective Steel Casing Elevation (feet)	Top of Inner PVC Casing Elevation (feet)	Comments
PZ-11	16.06	16.07	
PZ-12	16.02	15.92	
PZ-13	N/A	N/A	Abandoned
PZ-14	15.35	15.22	
PZ-15	14.51	14.02	
PZ-16	11.73	11.50	
PZ-17	12.95	12.75	
<i>PZ-18 through PZ-22 were temporary piezometers and have been removed</i>			
PZ-23	N/A		
PZ-24	N/A		
PZ-25	N/A		
PZ-26	N/A		
PZ-27	N/A		
PZ-28	N/A		
PZ-29	N/A		
PZ-30	N/A		
PZ-31	N/A		
PZ-32	N/A		
PZ-33	N/A		
PZ-34	N/A		
PZ-35	N/A		
PZ-36	N/A		
PZ-37	N/A		
PZ-38	N/A		
PZ-39	N/A		
PZ-40	N/A		
PZ-41	N/A		
PZ-42	N/A		
PZ-43	N/A		
PZ-44	N/A		
PZ-45	N/A		
PZ-46	N/A		
PZ-47	N/A		
PZ-48	N/A		
PZ-49	N/A		
PZ-50	N/A		
PZ-51	N/A		
PZ-52	N/A		
PZ-53	N/A		
PZ-54	N/A		

Table 2: Synoptic Water Level and NAPL Thickness Measurement Locations
OU1 Pre-Design Investigation - Diamond head Oil Superfund Site, Kearny, NJ

Well ID No.	Top of Protective Steel Casing Elevation (feet)	Top of Inner PVC Casing Elevation (feet)	Comments
PZ-55	N/A		
PZ-56	N/A		
PZ-57	N/A		
PZ-58	N/A		
PZ-59	N/A		
PZ-60	N/A		
PZ-61	N/A		
PZ-62	N/A		
PZ-63	N/A		
PZ-64	N/A		
PZ-65	N/A		
PZ-66	N/A		
PZ-67	N/A		
PZ-68	N/A		
PZ-69	N/A		
PZ-70	N/A		
PZ-71	N/A		
PZ-72	N/A		
PZ-73	N/A		
PZ-74	N/A		
PZ-75	N/A		
PZ-76	N/A		
PZ-77	N/A		
PZ-78	N/A		
PZ-79	N/A		
PZ-80	N/A		
PZ-81	N/A		
PZ-82	N/A		
PZ-83	N/A		
PZ-84	N/A		
PZ-85	N/A		
PZ-86	N/A		
PZ-87	N/A		
PZ-88	N/A		
PZ-89	N/A		
PZ-90	N/A		
PZ-91	N/A		
PZ-92	N/A		

Notes:

Protective Casing is the outer steel cover

Table 2: Synoptic Water Level and NAPL Thickness Measurement Locations
OU1 Pre-Design Investigation - Diamond head Oil Superfund Site, Kearny, NJ

Well ID No.	Top of Protective Steel Casing Elevation (feet)	Top of Inner PVC Casing Elevation (feet)	Comments
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Inner Casing is the inner PVC well riser

PID = Photoionization Detector

ppm = parts per million

BTIC = Below Top of Inner Casing (e.g. the inner PVC well riser)

NAPL = Non-Aqueous Phase Liquid

Locations to be sampled for municipal utility authority discharge permit parameters



- Notes:
- 1. Road configurations are subject to change based on site conditions
 - 2. Linear footage of main roads = 1800 ft
pond roads = 500 ft
 - 3. Area of vegetation clearing = 10 acres
 - 4. Proposed features are not to scale.

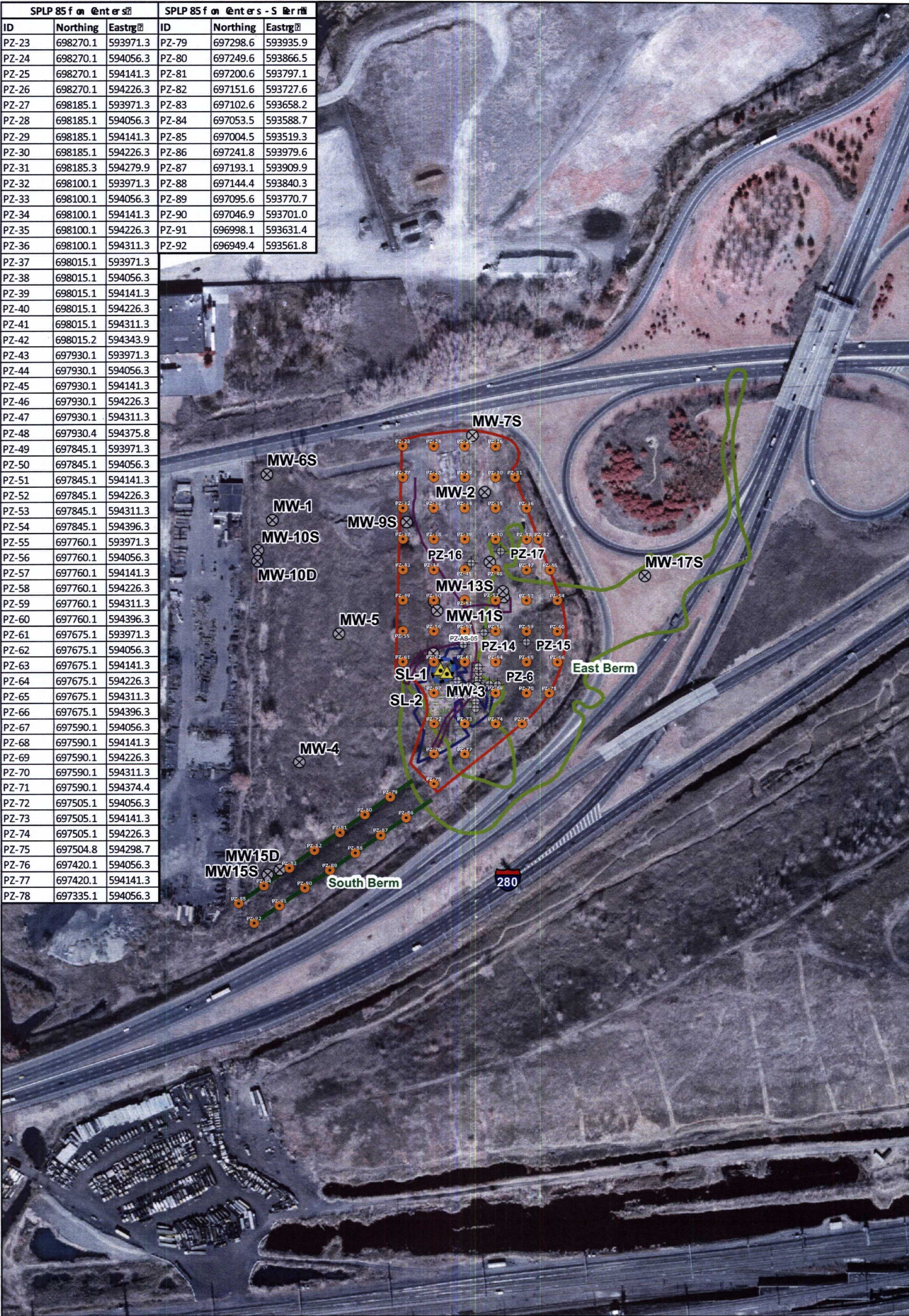
Legend

- Temporary Gravel Road
- Proposed Temporary Access Road Location (Approximate)
- Vegetation Mowing Area
- Delineated Wetlands

0 100 200 Feet

Figure 1
Site Preparation Activities
Diamond Head
Kearny, NJ

SPLP 85' on Centers			SPLP 85' on Centers - S Berri		
ID	Northing	Eastgri	ID	Northing	Eastgri
PZ-23	698270.1	593971.3	PZ-79	697298.6	593935.9
PZ-24	698270.1	594056.3	PZ-80	697249.6	593866.5
PZ-25	698270.1	594141.3	PZ-81	697200.6	593797.1
PZ-26	698270.1	594226.3	PZ-82	697151.6	593727.6
PZ-27	698185.1	593971.3	PZ-83	697102.6	593658.2
PZ-28	698185.1	594056.3	PZ-84	697053.5	593588.7
PZ-29	698185.1	594141.3	PZ-85	697004.5	593519.3
PZ-30	698185.1	594226.3	PZ-86	697241.8	593979.6
PZ-31	698185.3	594279.9	PZ-87	697193.1	593909.9
PZ-32	698100.1	593971.3	PZ-88	697144.4	593840.3
PZ-33	698100.1	594056.3	PZ-89	697095.6	593770.7
PZ-34	698100.1	594141.3	PZ-90	697046.9	593701.0
PZ-35	698100.1	594226.3	PZ-91	696998.1	593631.4
PZ-36	698100.1	594311.3	PZ-92	696949.4	593561.8
PZ-37	698015.1	593971.3			
PZ-38	698015.1	594056.3			
PZ-39	698015.1	594141.3			
PZ-40	698015.1	594226.3			
PZ-41	698015.1	594311.3			
PZ-42	698015.2	594343.9			
PZ-43	697930.1	593971.3			
PZ-44	697930.1	594056.3			
PZ-45	697930.1	594141.3			
PZ-46	697930.1	594226.3			
PZ-47	697930.1	594311.3			
PZ-48	697930.4	594375.8			
PZ-49	697845.1	593971.3			
PZ-50	697845.1	594056.3			
PZ-51	697845.1	594141.3			
PZ-52	697845.1	594226.3			
PZ-53	697845.1	594311.3			
PZ-54	697845.1	594396.3			
PZ-55	697760.1	593971.3			
PZ-56	697760.1	594056.3			
PZ-57	697760.1	594141.3			
PZ-58	697760.1	594226.3			
PZ-59	697760.1	594311.3			
PZ-60	697760.1	594396.3			
PZ-61	697675.1	593971.3			
PZ-62	697675.1	594056.3			
PZ-63	697675.1	594141.3			
PZ-64	697675.1	594226.3			
PZ-65	697675.1	594311.3			
PZ-66	697675.1	594396.3			
PZ-67	697590.1	594056.3			
PZ-68	697590.1	594141.3			
PZ-69	697590.1	594226.3			
PZ-70	697590.1	594311.3			
PZ-71	697590.1	594374.4			
PZ-72	697505.1	594056.3			
PZ-73	697505.1	594141.3			
PZ-74	697505.1	594226.3			
PZ-75	697504.8	594298.7			
PZ-76	697420.1	594056.3			
PZ-77	697420.1	594141.3			
PZ-78	697335.1	594056.3			



Legend

- Boring & Piezometer Point (85' on Centers)
- Phase 1 Monitoring Wells
- Phase 1 Piezometers
- Sludge Lagoon Sample (approximate locations)
- Temporary Gravel Road
- Berm Transects
- Extent of Historical Source Area (1976 Aerial Photo)
- Sludge Lagoon
- Delineated Wetlands
- Study Area

N

0

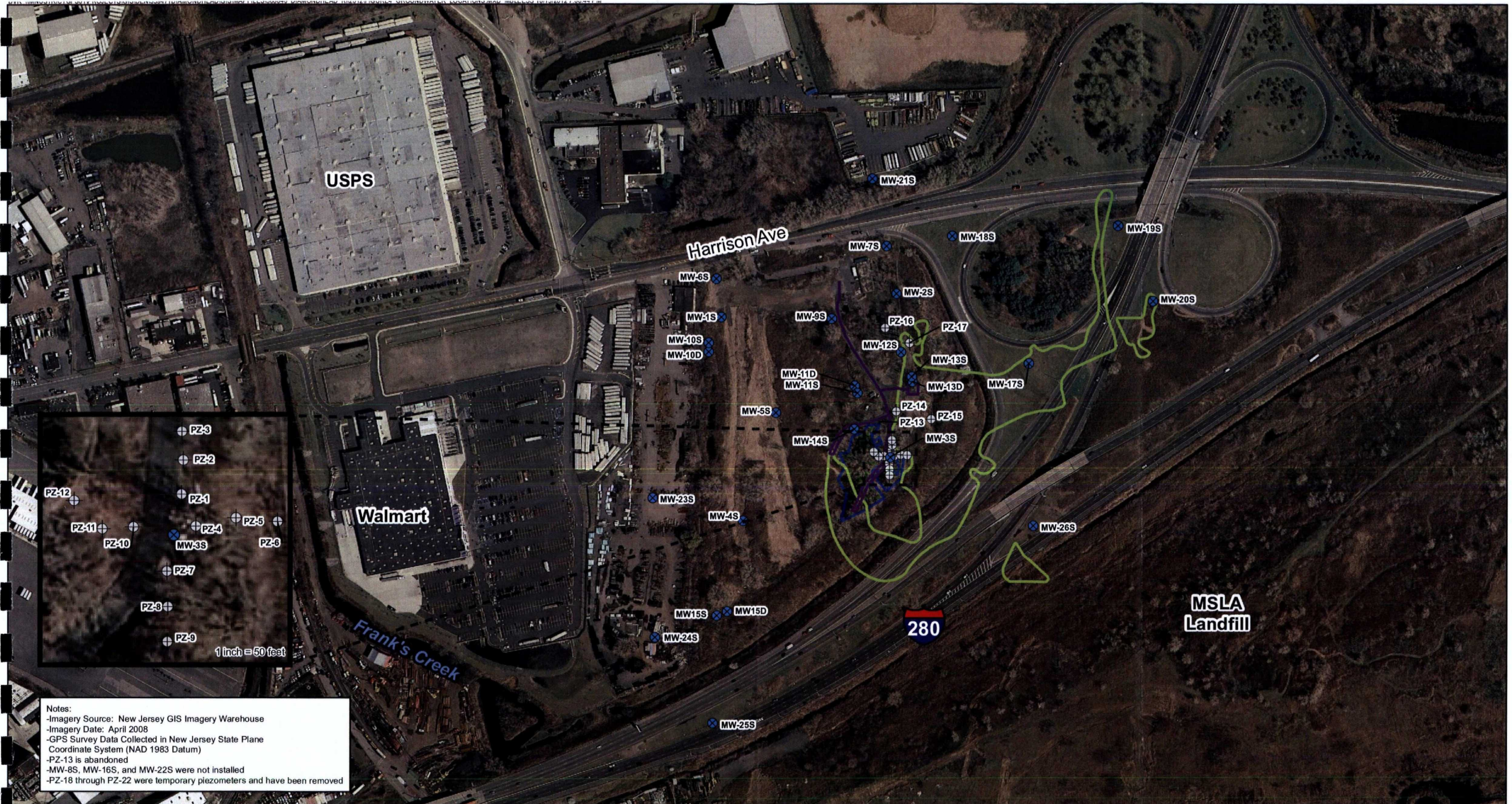
100

200

400

Feet

Figure 2
Proposed Soil Boring and Temporary Piezometer Sampling Grid
Diamond Head
Kearny, NJ



Legend

- Monitoring Well Location
- Piezometer
- Temporary Gravel Road
- Extent of Former Lagoon (1976 Aerial Photo)
- Delineated Wetlands

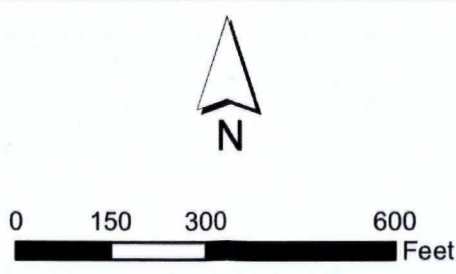
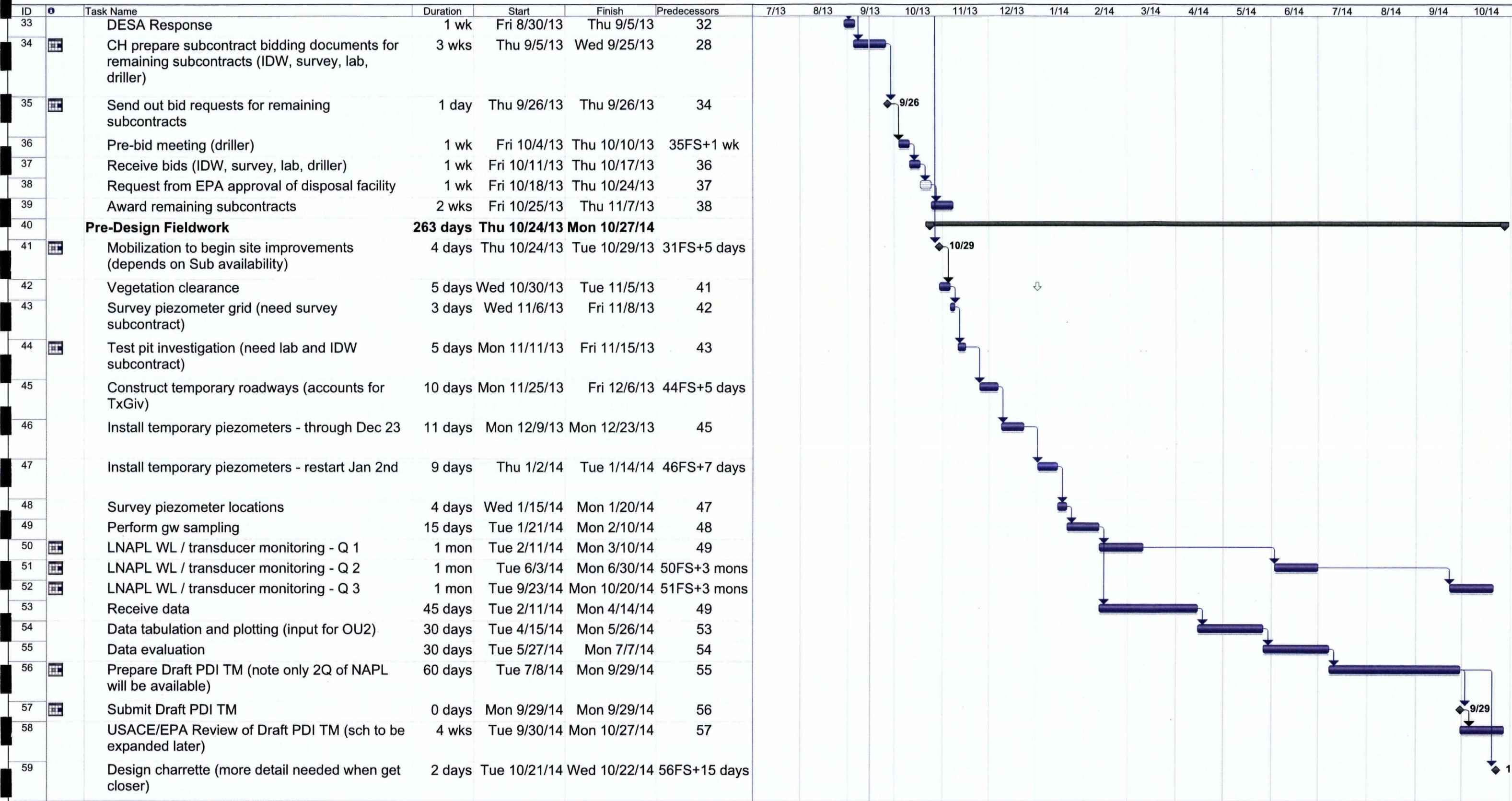


Figure 3
Groundwater Sampling Locations
OU1 Pre-Design Investigation
Diamond head Oil Superfund Site
Kearny, NJ

CH2MHILL

ID	Task Name	Duration	Start	Finish	Predecessors	7/13	8/13	9/13	10/13	11/13	12/13	1/14	2/14	3/14	4/14	5/14	6/14	7/14	8/14	9/14	10/14
1	Submit WVN for Work Plan preparation	1 day	Fri 9/7/12	Fri 9/7/12																	
2	Prepare revised Work Plan / complete technical checks	2 wks	Mon 9/10/12	Fri 9/21/12	1																
3	USEPA/USACE review of revised Work Plan	3 wks	Mon 9/24/12	Fri 10/12/12	2																
4	USEPA/USACE approval of revised Work Plan	1 day	Mon 10/15/12	Mon 10/15/12	3																
5	Prepare Cost Proposal for implementation of field investigation	2 wks	Tue 10/16/12	Mon 10/29/12	4																
6	Submit Cost Proposal	0 days	Mon 10/29/12	Mon 10/29/12	5																
7	USACE/EPA review cost proposal	5 days	Tue 10/30/12	Mon 11/5/12	6																
8	Technical Discussions on Cost Proposal	8 days	Tue 11/6/12	Thu 11/15/12	7																
9	CH2 Submit revised cost proposal (accounts for TxGiving)	1 wk	Fri 11/16/12	Thu 11/22/12	8																
10	CH complete draft planning documents	8 wks	Mon 10/29/12	Fri 12/21/12																	
11	CH submit draft planning documents for USACE/USEPA review	1 day	Mon 12/24/12	Mon 12/24/12	10																
12	USACE/USEPA review draft planning documents	6 wks	Tue 12/25/12	Mon 2/4/13	11																
13	CH address comments/submit revised documents	1.8 wks	Tue 2/5/13	Fri 2/15/13	12																
14	USACE/USEPA review/backcheck revised planning documents	1 wk	Mon 2/18/13	Fri 2/22/13	13																
15	USACE approve revised planning documents	1 day	Mon 2/25/13	Mon 2/25/13	14																
16	Restart 2013	45 days	Thu 7/18/13	Wed 9/18/13																	
17	USACE receives additional funding from EPA	1 day	Wed 9/11/13	Wed 9/11/13																	
18	CH submits revised proposal	1 day	Thu 7/18/13	Thu 7/18/13																	
19	USACE Contract Award	1 wk	Thu 9/12/13	Wed 9/18/13	17																
20	Planning Documents	45 days	Thu 7/25/13	Wed 9/25/13																	
21	CH submits response to comments on planning documents	1 day	Thu 7/25/13	Thu 7/25/13																	
22	EPA and USACE review CH reponse to comments on planning documents	2.5 wks	Fri 7/26/13	Tue 8/13/13	21																
23	CH submits redline based on feedback from EPA and USACE on response to comments	2 wks	Thu 8/15/13	Wed 8/28/13	22																
24	USACE backcheck of redline	2 wks	Thu 8/29/13	Wed 9/11/13	23																
25	CH prepare final planning documents	2 wks	Thu 9/12/13	Wed 9/25/13	24																
26	CH procure subcontracts	59 days	Mon 8/19/13	Thu 11/7/13																	
27	Receive udated bids for site improvements	1 day	Mon 8/19/13	Mon 8/19/13																	
28	Evaluate bids for site improvements (assumes that no clarifications on bid packages needed)	12 days	Tue 8/20/13	Wed 9/4/13	27																
29	Prepare consent package to USACE for site improvement sub	5 days	Thu 9/5/13	Wed 9/11/13	28																
30	USACE consent on site improvement subcontract	20 days	Thu 9/12/13	Wed 10/9/13	29																
31	Award of site improvement subcontract	5 days	Thu 10/10/13	Wed 10/16/13	30																
32	CH submit request to DESA to determine if they can perform the analyses	2 days	Wed 8/28/13	Thu 8/29/13																	



**Attachment
Cost Proposal
Provided under separate cover
Considered Confidential Business Information**